

memorandum

DATE: April 24, 1998

REPLY TO:
ATTN OF: Office of Environmental Policy and Assistance:Koss:202-586-7964

SUBJECT: Clean Air Act Information -- Analysis of Final Rule that Amends Leak Repair Provisions of Refrigerant Recycling Regulations

TO: Distribution

The Environmental Protection Agency (EPA) published a final rule (40 *CFR* Part 82 -- "Protection of Stratospheric Ozone: Supplemental Rule to Amend Leak Repair Provisions Under Section 608 of the Clean Air Act") in the August 8, 1995, *Federal Register* (60 *FR* 40420). This rule amends provisions of the final refrigerant recycling regulations published on May 14, 1993 (58 *FR* 28660) and affects the owners and operators of industrial process refrigeration equipment, and Federal commercial and comfort-cooling equipment that normally contain a charge of 50 pounds or more of a class I or class II refrigerant. This Office had notified Department of Energy (DOE) program and field elements about the promulgation of these regulations in a September 18, 1995, memorandum, "Notice : Promulgation of Final Rule to Amend Leak Repair Provisions of the Clean Air Refrigerant Recycling Regulations". An analysis of the rule and its multiple requirements is attached.

The final regulations have several provisions important to DOE facilities. The rule provides owners of affected equipment with greater flexibility in repairing leaks and retrofitting leaking chillers. Of particular interest to DOE, the final rule allows additional time beyond the 30-day leak repair period for Federally-owned chillers when the chillers are located in areas subject to radiological contamination. The regulations also provide for additional time beyond the one-year period to retrofit Federally-owned appliances if appropriations and procurement requirements limit the feasibility of completing the retrofit activities within one year. The rule accommodates concerns raised by EH, DP and DOE-Oak Ridge staff regarding Departmental compliance with leak repair requirements.

An electronic copy of this memorandum and guidance can be accessed from the EH-41 Web site: (<http://tis-nt.eh.doe.gov/oepa/>); from this location click on the "Focus Areas" button, then the "Ozone-Depleting Substances" selection, then the "OEPA Guidance/Correspondence on ODSs" selection. Specific questions on this material or general questions on the Department's phaseout of ozone-depleting substances should be directed to Ted Koss of my staff at 202-586-7964 or theodore.koss@eh.doe.gov.

(original signed by Andrew Wallo)

Andrew Wallo III
Director
Air, Water and Radiation Division

Attachment

**EPA'S SUPPLEMENTAL FINAL RULE RELATING TO LEAK
REPAIR PROVISIONS UNDER SECTION 608 OF THE CLEAN AIR ACT
60 FR 40420; AUGUST 8, 1995**

INTRODUCTION

This guidance summarizes information concerning the U.S. Environmental Protection Agency's (EPA's) supplemental final rule amending certain requirements in EPA's regulations for protection of stratospheric ozone. The final rule appeared in the August 8, 1995 Federal Register (FR) at pages 40420 - 40447. The rule amends existing regulations at 40 CFR 82 Subpart F - Recycling and Emissions Reduction. The effective date of the rule was September 7, 1995. The proposed rule was issued January 19, 1995 (60 FR 3992). Personnel at DOE facilities affected by the rule should consult the final rule in the August 8, 1995 FR for detailed information.^(a)

The final rule has several provisions important to DOE facilities. The rule provides owners of appliances^(b) which normally contain a charge of 50 pounds or more of a class I or class II^(c) refrigerant with greater flexibility in repairing leaks and retrofitting leaking appliances. Of particular interest to DOE, the final rule allows additional time beyond the 30-day leak repair period for Federally-owned chillers when the chillers are located in areas subject to radiological contamination. The final rule also provides for additional time beyond the one-year period to retrofit Federally-owned appliances if appropriations and procurement requirements limit the feasibility of completing the retrofit activities within one year. EPA clarifies in the rule that owners of appliances subject to the leak repair provisions must only reduce leak rates to below the allowable leak level. The rule also permits owners to evacuate appliances to slightly above atmospheric pressure to perform oil changes or, alternatively, recover the oil to a system receiver where the receiver will be evacuated to atmospheric pressure.

BACKGROUND ON §608 LEAK REPAIR REQUIREMENTS

On May 14, 1993, EPA issued a final rule (58 FR 28660) implementing §608 of the CAA. The rule established (1) a recycling program for ozone-depleting refrigerants, and (2) leak repair requirements to further minimize the emissions of class I and class II

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- (a) The final rule can be accessed at the following National Archives and Records Administration web site:
http://www.access.gpo.gov/su_docs/aces/aces140.html.
 - (b) The term "appliance" is defined at 40 CFR 80.152 as any device which contains and uses a class I or class II substance as a refrigerant and which is used for household or commercial purposes, including any air conditioner, refrigerator, chiller, or freezer.
 - (c) Class I and class II substances are listed in §602 of the Clean Air Act (CAA).

refrigerants from leaking equipment. Appliances that normally contain more than 50 pounds of refrigerant are subject to the leak repair requirements [40 CFR 82.156(i)]. The rule set an annual maximum allowable leak rate of 35% of the total refrigerant charge per year for commercial refrigeration and industrial process refrigeration equipment and 15% for other appliances. When these stipulated leak rates are exceeded, the 1993 rule specified that the leaking appliance must be repaired within 30 days of when the leak was discovered or should have been discovered. An alternative is to develop a retrofit or replacement plan for the appliance within 30 days which outlines the plan to retrofit or replace the appliance within one year from detecting the leak.

EPA's January 19, 1995 proposal to amend the 1993 rule was issued to reflect new information available to EPA including:

- information on the difficulties faced by Federal agencies, particularly DOE, in meeting the requirements of the 1993 final rule
- information supplied to EPA by the Chemical Manufacturers Association (CMA) showing that under certain circumstances the timelines established for repairing leaking appliances were not achievable
- a settlement agreement reached by EPA and the CMA that provided for additional leak repair time for industrial process refrigerant equipment based on the uniqueness of this sector.

DISCUSSION OF SPECIFIC CHANGES INTRODUCED BY THE 8/8/95 FINAL RULE

All of the changes made in the August 1995 final rule are to 40 CFR 82, Subpart F - Recycling and Emissions Reduction. Specific changes relevant to DOE facilities are discussed below.

1. §82.152 Definitions

The 8/8/95 final rules added definitions for the following terms: critical component, custom-built, follow-up verification test, full charge, industrial process shutdown, initial verification test, normal operating characteristics, suitable replacement refrigerant, and system mothballing. In addition, the definition of the term "industrial process refrigeration" was modified. Definitions for these terms are given in footnotes in the following pages as the terms are used in the discussion.

2. §82.156 Required Practices

The existing leak repair provisions in 40 CFR 82.156(i) were extensively revised in the final rule. Evacuation requirements for appliance oil changes were also changed.

Evacuation Requirements for Oil Changes [§82.156(a)(2)(i)(C)]

Persons opening or disposing of appliances must generally evacuate the refrigerant in the unit to a recovery or recycling machine [40 CFR 82.156(a)]. A new §82.156(a)(2)(i)(C) was added as part of the settlement with the CMA which revises the evacuation requirements for oil changes to permit a slight positive pressure not to exceed 5 pressure per square inch gauge (psig).

Leak Repair Requirements [§82.156(i)]

The 1993 rule codified the leak repair requirements for commercial refrigeration equipment and industrial process refrigeration equipment in §82.156(i)(1). The 1995 final rule separates the requirements for the two categories of equipment. Requirements for commercial refrigeration equipment remain in §82.156(i)(1). Requirements for industrial process refrigeration equipment are in §82.156(i)(2). In addition, leak repair requirements for appliances other than commercial refrigeration or industrial process equipment (e.g., comfort cooling appliances) were moved from §82.156(i)(2) under the 1993 rule to §82.156(i)(5) under the 1995 rule. The current leak repair requirements for each of these three categories of appliances are discussed below. The 1995 rule also establishes requirements for verification testing in §82.156(i)(3). These requirements are discussed following the discussion of the three categories of appliances.

Commercial Refrigeration Equipment [§82.156(i)(1)]

The requirement in §82.156(i)(1) from the 1993 rule that owners or operators of commercial refrigeration^(d) equipment normally containing more than 50 pounds of refrigerant must have leaks repaired if the appliance is leaking at a rate such that the loss of refrigerant will exceed 35% of the total charge during a 12-month period is retained in the 1995 rule [§82.156(i)(1)]. The new rule adds that repairs must bring the annual leak rate to below 35%. Unless the owner or operator qualifies for or is granted additional time, repairs must be made within 30 days after discovery, or within 30 days after when the leaks should have been discovered if the owners intentionally shielded themselves from information which would have revealed a leak [§82.156(i)(9)].

For commercial refrigeration equipment as well as other categories of appliances, purged refrigerant that is destroyed at a verifiable destruction efficiency of 98% or

(d) For purposes of §82.156(i), the term “commercial refrigeration” is defined at 40 CFR 80.152 to be the refrigeration appliances utilized in the retail food and cold storage warehouse sectors. Retail food includes the refrigeration equipment found in supermarkets, convenience stores, restaurants and other food service establishments. Cold storage includes the equipment used to store meat, produce, dairy products, and other perishable goods. All of the equipment contains large refrigerant charges, typically over 75 pounds.

greater is not counted in the leak rate [§82.156(i)(11)]. Owners or operators relying on this provision must satisfy the recordkeeping requirements in §82.166(p).

The rule includes the following four exceptions to the 30-day repair requirement, two of which are specific to Federal agencies. Any owner or operator relying on one of the exceptions for commercial refrigeration equipment as well as the other two categories of appliances must satisfy the reporting and recordkeeping requirements in 40 CFR 82.166(n) which are discussed later in this guidance.

1. Leaks do not have to be repaired within the 30-day period if the owner or operator develops a plan to retrofit or retire the leaking equipment within one year [§82.156(i)(6)]. The plan must be prepared within 30 days of leak detection and kept at the site of the appliance. This exception also existed under the 1993 rule.
2. The amount of time for owners and operators to complete repairs, retrofit plans, or retrofits/replacements/retirements is temporarily suspended at the time an appliance is mothballed.^(e) The time for owners and operators to complete repairs, retrofit plans, or retrofits/replacements resumes on the day the appliance is brought back on-line and is no longer considered mothballed [§82.156(i)(10)].
3. Owners or operators of Federally-owned commercial or comfort-cooling appliances are allowed an additional year to complete the retrofit or retirement of the appliances if the following three conditions are met [§82.156(i)(8)]:
 - (A) Due to complications presented by the Federal agency appropriations and/or procurement process, a delivery time of more than 30 weeks from the beginning of the official procurement process is quoted, or where the appliance is located in an area subject to radiological contamination and creating a safe working environment will require more than 30 weeks;
 - (B) The operator notifies EPA within six months of the expiration of the 30-day period following the discovery of an exceedance of the applicable allowable annual leak rate and describes the appliance involved, explains why more than one year is needed, and

(e) The term “system mothballing” is defined at 40 CFR 80.152 as the intentional shutting down of a refrigeration appliance undertaken for an extended period of time by the owners or operators of that facility, where the refrigerant has been evacuated from the appliance or the affected isolated section of the appliance, at least to atmospheric pressure.

demonstrates that the recordkeeping requirements in §82.166(o) are met; and

(C) The operator maintains records adequate to allow a determination that the three conditions are met.

Owners or operators of Federally-owned commercial or comfort-cooling appliances are allowed one year beyond the additional year to complete retrofitting, replacement or retiring such appliances if needed. The request is to be submitted to EPA before the end of the ninth month of the first additional year and shall include revisions of information submitted earlier as required under §82.166(o). Unless EPA objects to this request within 30 days of receipt, it shall be deemed approved.

4. The 1995 rule also provides an exception to a 30-day repair requirement that principally applies to chillers operated by DOE. Specifically, §82.156(i)(1)(ii) provides that Federal agencies using equipment within the definition of commercial refrigeration equipment can have more than 30 days to repair leaks if the refrigeration appliance is located in an area subject to radiological contamination or where the shutting down of the appliance will directly lead to radiological contamination. Only the additional time needed to conduct and complete repairs in a safe working environment is permitted.

Industrial Process Refrigeration Equipment [§82.156(i)(2)]

The requirement in §82.156(i)(1) from the 1993 rule that owners or operators of industrial process refrigeration^(f) equipment normally containing more than 50 pounds of refrigerant must have leaks repaired if the appliance is leaking at a rate such that the loss of refrigerant will exceed 35% of the total charge during a 12-month period is retained in the 1995 rule [§82.156(i)(2)]. The new rule adds that repairs must bring the annual leak rate to below 35%. Unless the owner or operator qualifies for or is granted additional time, repairs must be made within 30 days after discovery, or within 30 days after when the leaks should have been discovered if the owners intentionally shielded themselves from information which would have revealed a leak [§82.156(i)(9)].

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- (f) The term “Industrial process refrigeration” is defined at 40 CFR 82.152 as meaning [for the purposes of § 82.156(i)] complex customized appliances used in the chemical, pharmaceutical, petrochemical and manufacturing industries. These appliances are directly linked to the industrial process. This sector also includes industrial ice machines, appliances used directly in the generation of electricity, and ice rinks. Where one appliance is used for both industrial process refrigeration and other applications, it will be considered industrial process refrigeration equipment if 50% or more of its operating capacity is used for industrial process refrigeration.

The rule includes the following five exceptions to the 30-day repair requirement.

1. As with commercial refrigeration equipment, leaks do not have to be repaired within the 30-day period if the owner or operator develops a plan to retrofit or retire the leaking equipment within one year [§82.156(i)(6)]. The plan must be prepared within 30 days of leak detection and kept at the site of the appliance.
2. Owners and operators are allowed additional time to complete the retrofit or retirement under the following two conditions. Adequate notification to EPA and records must be maintained to qualify. Specific details are in §82.156(i)(7).
 - a. Additional time, to the extent reasonably necessary, is allowed due to delays caused by the requirements of other applicable Federal, State, or local laws or regulations, or due to the unavailability of a suitable replacement refrigerant^(g) with a lower ozone depletion potential [§82.156(i)(7)(i)].
 - b. An additional one-year period beyond the initial one-year retrofit period [§82.156(i)(6)] is allowed for industrial process refrigeration equipment where (1) the new or the retrofitted industrial process refrigerant equipment is custom-built^(h), and (2) the supplier of the appliance or one or more of its critical components⁽ⁱ⁾ has quoted a delivery time of more than 30 weeks from when the order is placed [§82.156(i)(7)(ii)]. Further time beyond the additional one-year retrofit period may be requested before the end of the ninth month of the first additional year [§82.156(i)(7)(iii)].

(g) The term “suitable replacement refrigerant” is defined in 40 CFR 80.152 [for the purposes of §82.156(i)(7)(i)] to mean a refrigerant that is acceptable under §612(c) of the CAA and all regulations promulgated under that section, compatible with other materials with which it may come into contact, and able to achieve the temperatures required for the affected industrial process in a technically feasible manner.

(h) The term “custom-built” is defined in 40 CFR 80.152 [for the purposes of §82.156(i)] to mean that the equipment or any of its critical components cannot be purchased and/or installed without being uniquely designed, fabricated and/or assembled to satisfy a specific set of industrial process conditions.

(i) The term “critical component” is defined in 40 CFR 80.152 [for the purposes of §82.156(i)] to mean a component without which industrial process refrigeration equipment will not function, will be unsafe in its intended environment, and/or will be subject to failures that would cause the industrial process served by the refrigeration appliance to be unsafe.

3. As with commercial refrigeration equipment, the amount of time for owners and operators to complete repairs, retrofit plans, or retrofits/replacements/retirements is temporarily suspended at the time an appliance is mothballed. The time for owners and operators to complete repairs, retrofit plans, or retrofits/replacements resumes on the day the appliance is brought back on-line and is no longer considered mothballed [§82.156(i)(10)].
4. Owners and operators are allowed a 120-day repair period when an industrial process shutdown^(j) is needed to make repairs [§82.156(i)(2)(ii)].
5. Additional time is allowed if necessary parts are unavailable or if requirements of other regulatory agencies make a repair within the 30-day period (or 120 days in the case of an industrial process shutdown) impossible. Only the additional time needed to receive delivery of the necessary parts or to comply with the pertinent regulations is allowed [§82.156(i)(2)(i)]. All necessary repairs that do not require additional time must be made within the 30 or 120 day period [§82.156(i)(2)].

Other Appliances [§82.156(i)(5)]

The requirement in §82.156(i)(2) from the 1993 rule that owners or operators of appliances other than commercial refrigeration equipment and industrial process refrigeration equipment that normally contain more than 50 pounds of refrigerant must have leaks repaired if the appliance is leaking at a rate such that the loss of refrigerant will exceed 15% of the total charge during a 12-month period is retained in the 1995 rule [§82.156(i)(5)]. The new rule adds that repairs must bring the annual leak rate to below 15%. Unless the owner or operator qualifies for or is granted additional time, repairs must be made within 30 days after discovery, or within 30 days after when the leaks should have been discovered if the owners intentionally shielded themselves from information which would have revealed a leak [§82.156(i)(9)].

The rule includes four exceptions to the 30-day repair requirement. The first three exceptions are the same as exceptions 1-3 discussed above for commercial refrigeration equipment. These exceptions are based on §82.156(i)(6), §82.156(i)(10), and §82.156(i)(8). In addition to these exceptions, owners or operators of Federally-owned comfort-cooling appliances may have more than 30 days to repair leaks where the refrigeration appliance is located in an area subject to radiological contamination or where the shutting down of the appliance will directly lead to radiological contamination [§82.156(i)(5)(ii)]. Only the additional time needed to conduct and complete work in a safe environment is permitted.

(j) The term “industrial process shutdown” is defined in 40 CFR 80.152 [for the purposes of §82.156(i)] to mean an industrial process or facility temporarily ceases to operate or manufacture whatever is being produced at that facility.

Verification Testing [§82.156(i)(3)]

Many owners and operators of appliances who are granted additional time to repair leaking equipment must meet the new verification testing requirements in §82.156(i)(3). These requirements apply to all owners or operators of industrial process refrigeration equipment who are granted additional time and also to owners or operators of Federally-owned commercial refrigeration equipment [§82.156(i)(1)(iii)] and comfort-cooling appliances [§82.156(i)(5)(iii)] who are granted time extensions.

Section 82.156(i)(3) includes the following requirements

- repairs must be made so that sound professional judgment indicates they will be sufficient to bring the leak rates below the applicable allowable rate
- an initial verification test^(k) must be conducted after repairs are made and a subsequent follow-up verification^(l) test conducted within 30 days
- when an industrial process shutdown has occurred or when repairs have been made while an appliance is mothballed, an initial verification test is to be conducted at the conclusion of the repairs and a follow-up verification test

(k) The term “initial verification test” is defined in 40 CFR 80.152 [for the purposes of §82.156(i)] as those leak tests that are conducted as soon as practicable after the repair is completed. An initial verification test, with regard to the leak repairs that require the evacuation of the appliance or portion of the appliance, means a test conducted prior to the replacement of the full refrigerant charge and before the appliance or portion of the appliance has reached operation at normal operating characteristics or conditions (the term “normal operating characteristics or conditions” is defined in 40 CFR 82.152) and conditions of temperature and pressure. An initial verification test with regard to repairs conducted without the evacuation of the refrigerant charge means a test conducted as soon as practicable after the conclusion of the repair work.

(l) The term “follow-up verification test” is defined in 40 CFR 80.152 [for the purposes of §82.156(i)] as those tests that involve checking the repairs within 30 days of the appliance's returning to normal operating characteristics and conditions. Follow-up verification tests for appliances from which the refrigerant charge has been evacuated means a test conducted after the appliance or portion of the appliance has resumed operation at normal operating characteristics and conditions of temperature and pressure, except in cases where sound professional judgment dictates that these tests will be more meaningful if performed prior to the return to normal operating characteristics and conditions. A follow-up verification test with respect to repairs conducted without evacuation of the refrigerant charge means a reverification test conducted after the initial verification test and usually within 30 days of normal operating conditions. Where an appliance is not evacuated, it is only necessary to conclude any required changes in pressure, temperature or other conditions to return the appliance to normal operating characteristics and conditions.

conducted with 30 days of completing the repairs or within 30 days of bringing the appliance back online, if taken offline, but no sooner than when the system has achieved normal operating characteristics and conditions^(m)

- if a follow-up verification test indicates that repairs have not been successfully completed, the owner must notify EPA within 30 days [§82.156(i)(3)(iii)], and
 - retrofit or replace the equipment [§82.156(i)(3)(ii)], or
 - complete second repair efforts according to the requirements in §82.156(i)(3)(iv), or
 - establish within 180 days that the appliance's annual leak rate (based on the full charge⁽ⁿ⁾ for the affected equipment) does not exceed the applicable allowable annual leak rate [§82.156(i)(3)(v), §82.156(i)(4)].

3. §82.166 Reporting and Recordkeeping Requirements

EPA's 8/8/95 final rule also added certain leak repair reporting and recordkeeping requirements to 40 CFR 82.166. Various sections of 40 CFR 82.156 make reference to the reporting and recordkeeping requirements in §82.166. The following information must be reported in appropriate cases as required by §82.156.

- the reasons why more than 30 days are needed to complete the work and an estimate of when repair work will be completed [§82.166(n)(1)]
- if the owners or operator intends to establish that the appliance's annual leak rate does not exceed the applicable allowable annual leak rate in accordance with §82.156(i)(3)(v), the owner or operator must submit a plan to fix other

(m) The term "normal operating characteristics or conditions" is defined in 40 CFR 80.152 [for the purposes of §82.156(i)] as temperatures, pressures, fluid flows, speeds, and other characteristics that would normally be expected for a given process load and ambient condition during operation. Normal operating characteristics and conditions are marked by the absence of atypical conditions affecting the operation of the refrigeration appliance.

(n) The term "full charge" is defined in 40 CFR 80.152 [for the purposes of §82.156(i)] as the amount of refrigerant required for normal operating characteristics and conditions of the appliance as determined by using one of the following four methods or a combination of one of the following four methods: (1) the equipment manufacturers' determination of the correct full charge for the equipment; (2) determining the full charge by appropriate calculations based on component sizes, density of refrigerant, volume of piping, and all other relevant considerations; (3) the use of actual measurements of the amount of refrigerant added or evacuated from the appliance; and/or (4) the use of an established range based on the best available data, regarding the normal operating characteristics and conditions for the appliance, where the mid-point of the range will serve as the full charge, and where records are maintained in accordance with §82.166(q).

- outstanding leaks for which repairs are planned but not yet completed to achieve a rate below the applicable allowable leak rate [§82.166(n)(2)]
- the dates and types of all initial and follow-up verification tests performed and the test results for all initial and follow-up verification tests must be maintained and submitted to EPA within 30 days after conducting each test [§82.166(n)(3)].

Information submittals are to include: identification of the facility; the leak rate; the method used to determine the leak rate and full charge; the date a leak rate of greater than the allowable annual leak rate was discovered; the location of leaks(s) to the extent determined to date; and any repair work that has been completed thus far and the date that work was completed.

Section 82.166(o) requires the submittal of the following information when the owner or operator seeks a leak repair time extension under §82.156 (i)(7) or (i)(8):

- identification of the industrial process facility
- the leak rate
- the method used to determine the leak rate and full charge
- the date a leak rate of 35% or greater was discovered
- the location of leaks(s) to the extent determined to date
- any repair work that has been completed thus far and the date that work was completed
- a plan to complete the retrofit or replacement of the system
- the reasons why more than one year is necessary to retrofit to replace the system
- the date of notification to EPA
- an estimate of when retrofit or replacement work will be completed and an explanation if the completion date is changed.

Owners or operators who wish to exclude purged refrigerants that are destroyed from annual leak rate calculations [§82.156(i)(11)] must maintain adequate records onsite to support the amount of refrigerant claimed as sent for destruction [§82.166(p)].

Section 82.166(q) contains information submittal requirements related to determining the full charge of an appliance.